

Spring Flood Outlook for Iowa



National Weather Service

Des Moines, IA

March 9, 2023

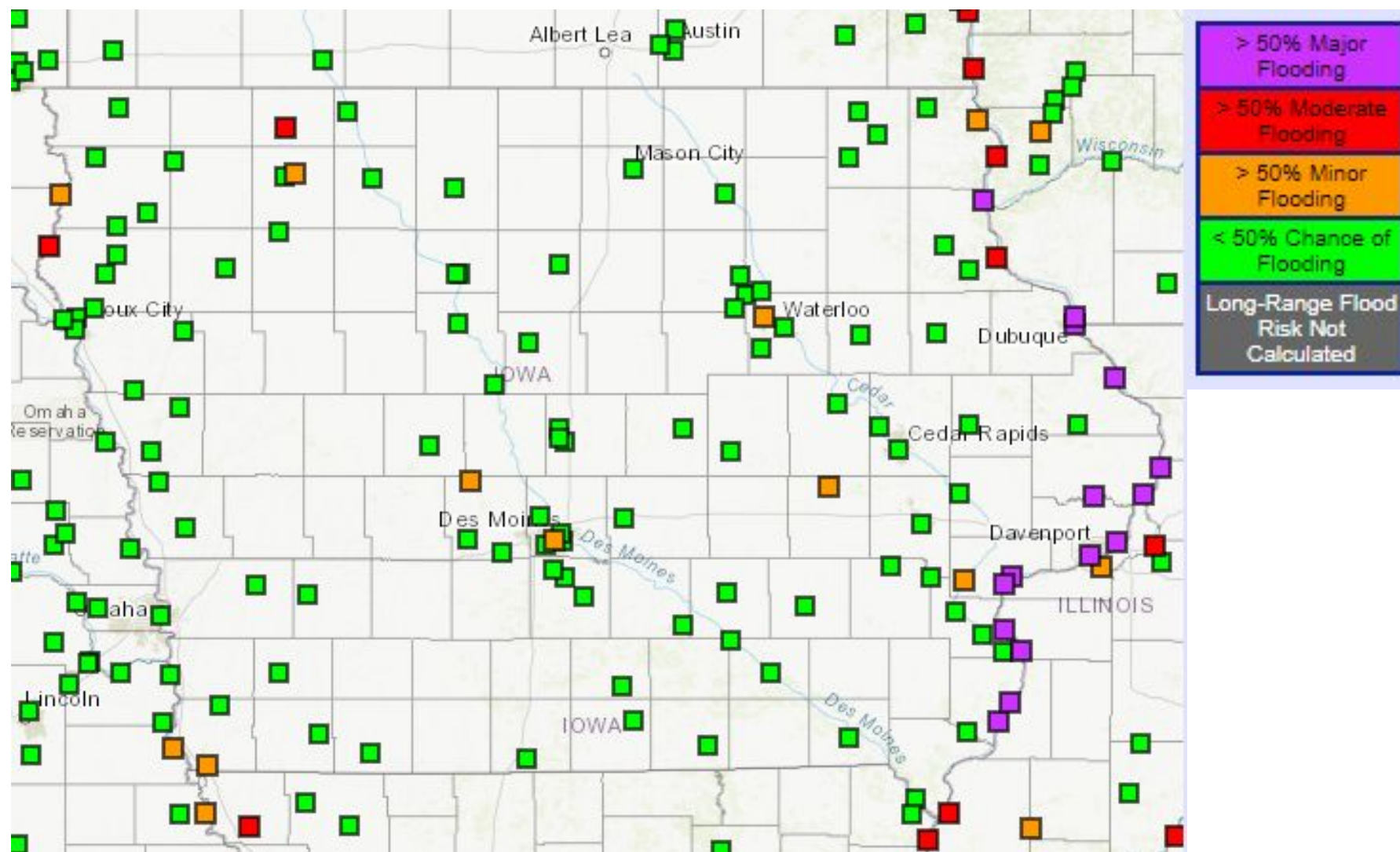


Spring 2023 Flood Outlook for Iowa

Overview

Key Messages

- Much above normal spring flood threat for the Mississippi River. **Probabilities for significant flooding on the Mississippi River have increased. Flooding along the Mississippi River has the potential to be similar to what happened in 2019.**
- Near to below normal spring flood threat for the rest of the state—except for the Missouri River below Council Bluffs, where the risk is above normal.
- Future weather—especially the weather conditions leading up to, during and immediately after the snowmelt period—can be a big factor in any spring flood threat.
- Points highlighted in orange, red or purple have a >50% chance of reaching minor flood stage over the next 90 days.
- **This is the final spring flood outlook.** Normal probabilistic outlooks for 90-day periods will resume around April 1.



Flood risk from mid March through early June

[Click here for the latest map](#)





Spring 2023 Flood Outlook for Iowa

Flood risk by river, 3/8/2023

Below is the spring flood risk for the rivers in and bordering Iowa. Where the risk on a given river changes above or below a certain point, the river is broken into segments.

| River | Spring Flood Risk |
|--|--|
| Mississippi River–down to Davenport | Much above normal. Probabilities for significant flooding have increased. |
| Mississippi River–downstream of Davenport | Much above normal. Probabilities for significant flooding have increased. |
| Big Sioux River (far northwest Iowa) | Near normal |
| Missouri River–down to Council Bluffs | Near to below normal |
| Missouri River–downstream of Council Bluffs | Above normal |
| Tributaries to Mississippi River in Eastern Iowa | Near to below normal |
| Tributaries to Mississippi River in Central Iowa | Near to below normal |
| Tributaries to Big Sioux River | Near normal |
| Tributaries to Missouri River in Iowa | Near to below normal |





Spring 2023 Flood Outlook for Iowa

Spring flood element checklist, 3/8/2023

Below is the spring flood element checklist including the impact of current conditions on potential spring flooding. The individual elements appear on the following slides. Flooding from ice jams is a minimal risk this year, but there may be some localized issues mainly across the far north.

| Element | Impact on Potential Spring Flooding | Link to Latest Information |
|--------------------------------|--|--|
| River levels | Neutral to increased risk | USGS WaterWatch |
| Soil moisture | Increased risk (northeast), neutral (central), decreased risk (far west) | NWS/CPC Soil Moisture |
| Snowpack/snow water equivalent | Neutral; increased risk for the Mississippi River and upper portions of the Des Moines River basin | NWS/NOHRSC Snow Water Equivalent |
| Frost depth | Neutral | NWS Frost Depth |
| Monthly temperature outlook | Increased risk (especially Mississippi River) | NWS/CPC Outlooks |
| Monthly precipitation outlook | Neutral to increased risk | NWS/CPC Outlooks |

For your reference, here are links to the current [Drought Monitor](#) as well as the [Seasonal Drought Outlook](#).





Spring 2023 Flood Outlook for Iowa

Chances for significant flooding on the Mississippi River have increased—Why?

Future weather—especially the weather conditions leading up to, during and immediately after the snowmelt period—is the biggest factor for significant spring flooding.

Factors leading to increased chances

- Slower than normal warm-up leading up to the snowmelt period—keeps the snowpack longer
- Fast warm-up during the snowmelt period—leads to rapid snowmelt
- Above normal precipitation leading up to the snowmelt period—adds more water to the system
- Moderate to heavy precipitation (rainfall) during the snowmelt period—including rain on snow—adds more water to the system
- Above normal precipitation immediately after the snowmelt period—prolongs the higher river stages and may result in secondary crests

Factors leading to decreased chances

- Normal warm-up leading up to the snowmelt period
- Slow and steady snowmelt—introduces water to the system more slowly
- Little to no additional precipitation during the snowmelt period—adds little if any additional water to the system
- Normal precipitation immediately after the snowmelt period—allows the river levels to fall back to normal levels

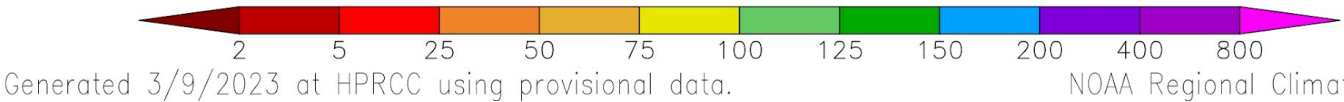
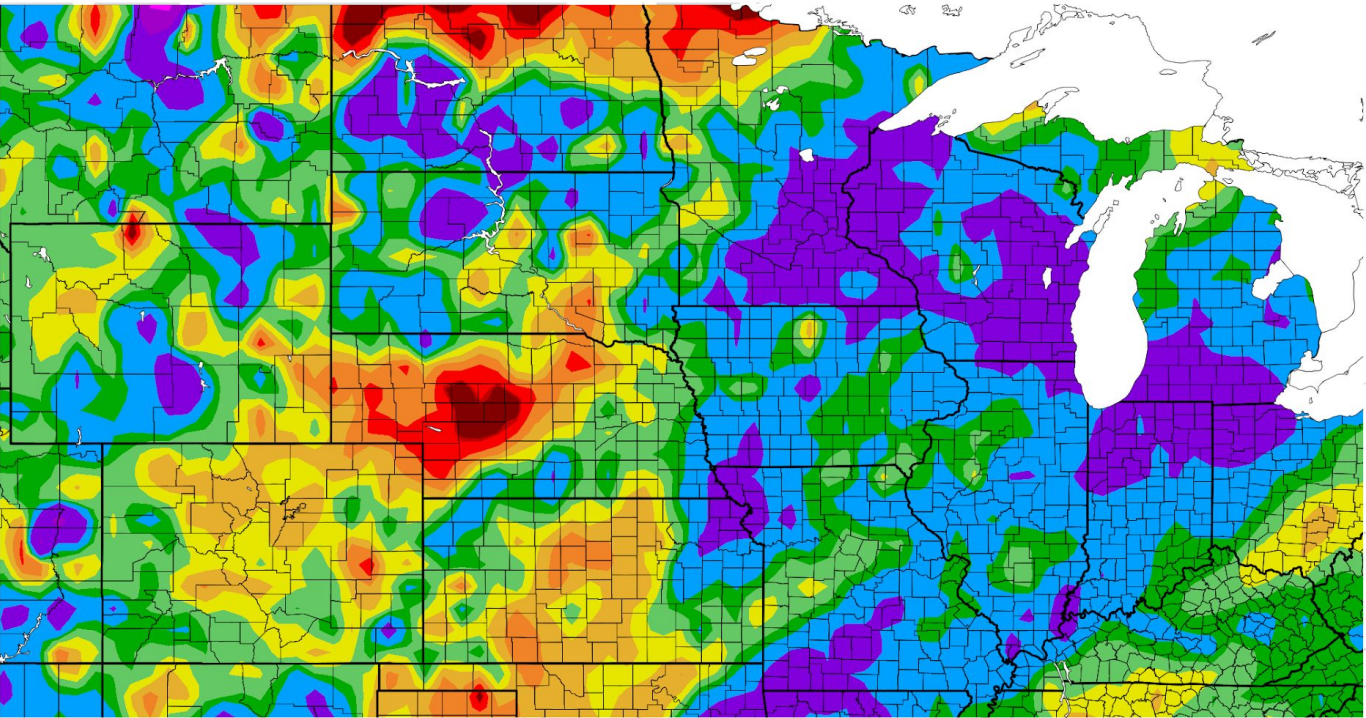




Spring 2023 Flood Outlook for Iowa

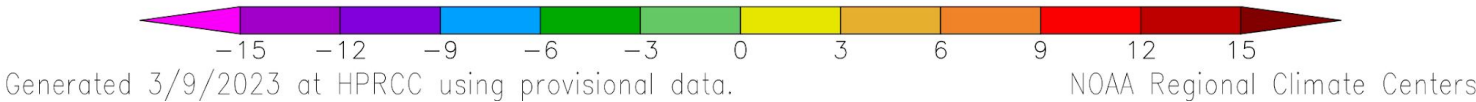
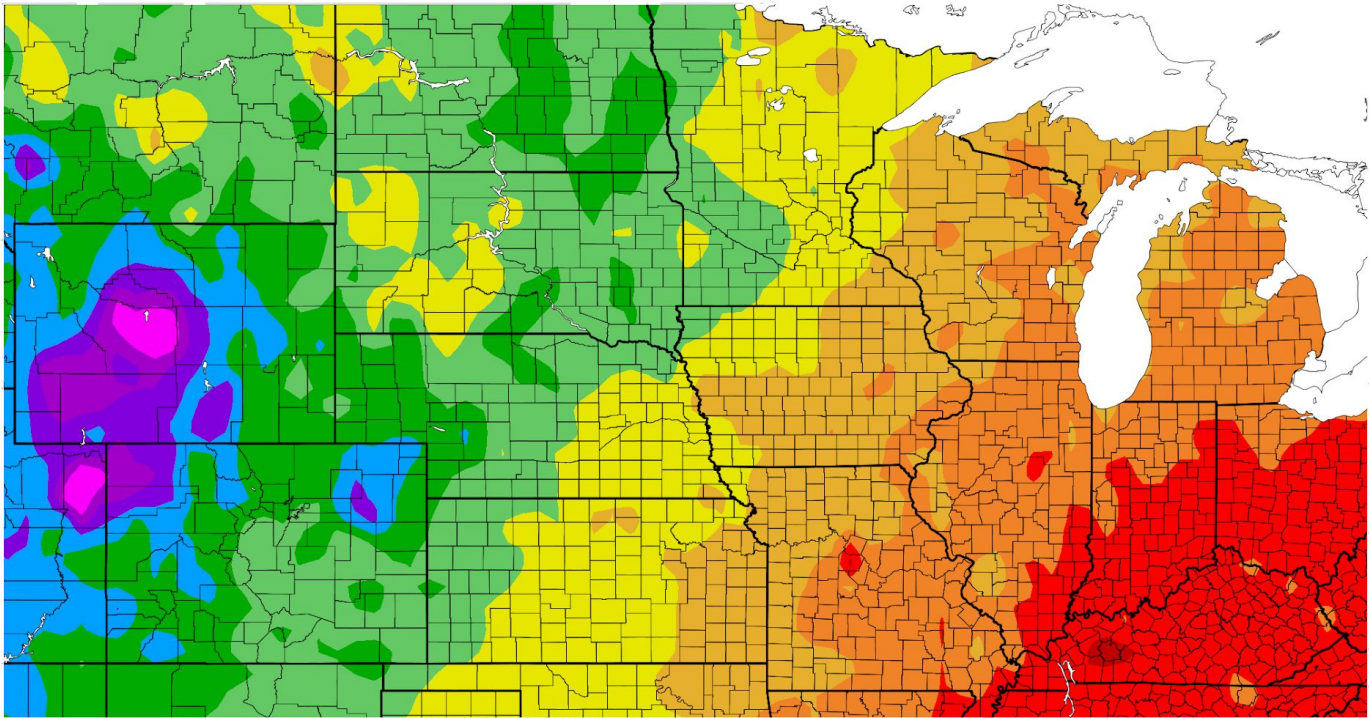
Percent of normal precipitation and departure from normal temperature, last 30 days

Percent of Normal Precipitation (%)
2/7/2023 – 3/8/2023



Above and below normal across Iowa

Departure from Normal Temperature (F)
2/7/2023 – 3/8/2023



Mainly above normal across Iowa, except below normal across the far northwest

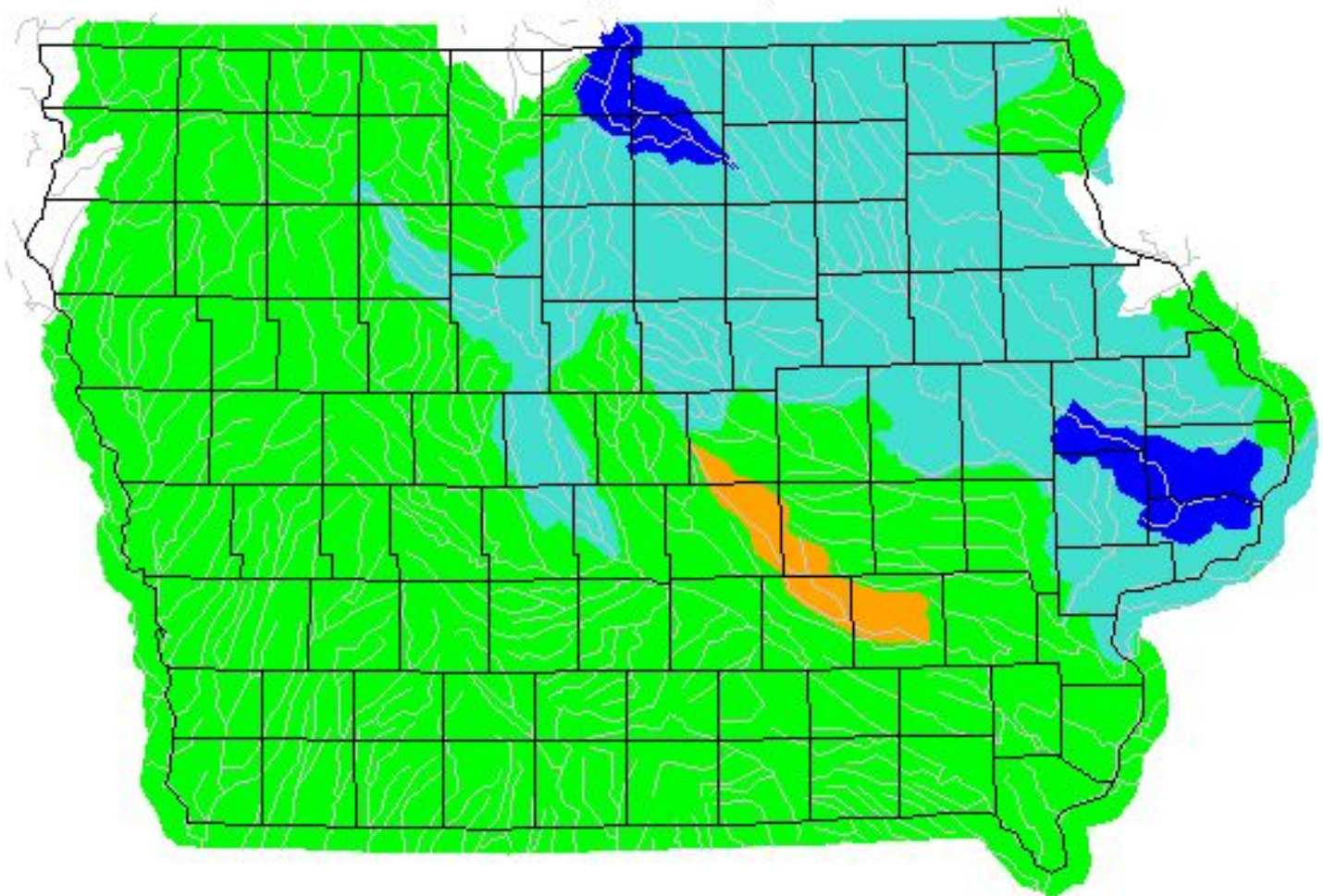




Spring 2023 Flood Outlook for Iowa

River level percentiles

Wednesday, March 08, 2023



Generally near to above normal stream flows across Iowa



| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|------|---------|
| | | | | | | | |
| Low | <10 | 10-24 | 25-75 | 76-90 | >90 | High | No Data |
| | Much below normal | Below normal | Normal | Above normal | Much above normal | | |

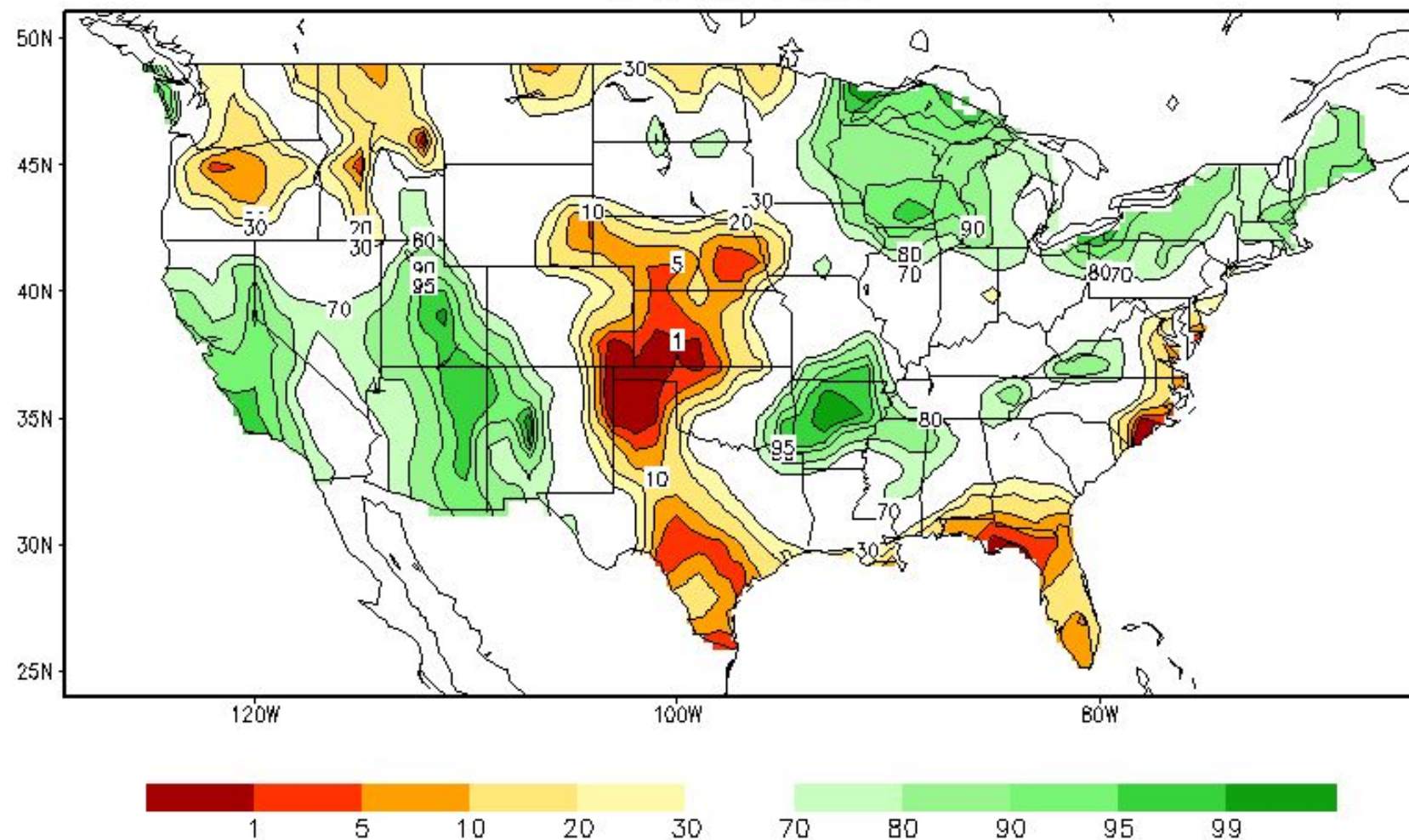




Spring 2023 Flood Outlook for Iowa

Soil moisture percentiles

Calculated Soil Moisture Ranking Percentile
MAR 08, 2023



30th to 70th percentile is near normal (white)
>70th percentile is above normal (green)
<30th percentile is below normal (brown/red)

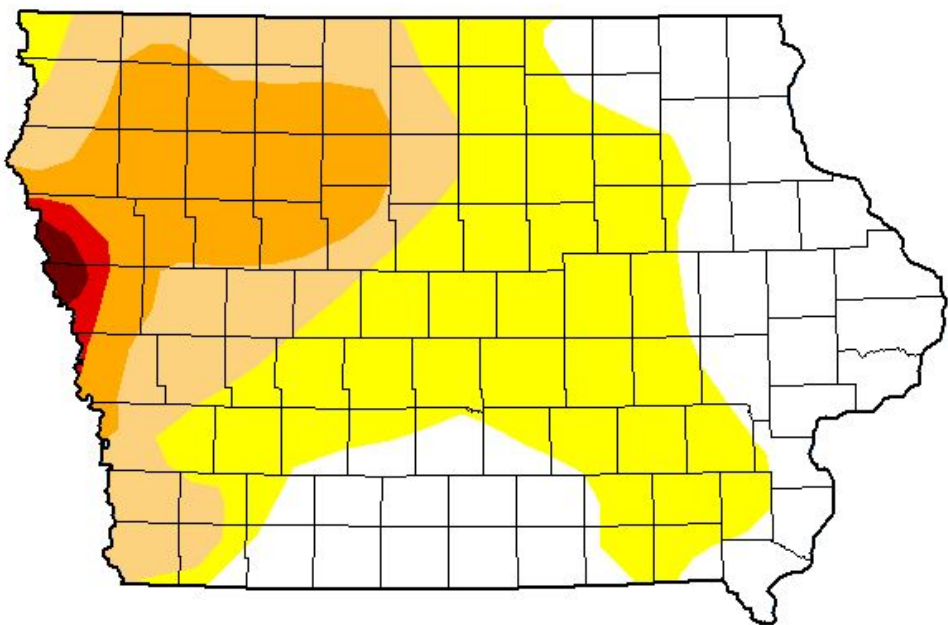
Above normal across northeastern Iowa, near normal central and below normal across the west



Spring 2023 Flood Outlook for Iowa

Drought Monitor and Drought Monitor class change, 1 year

U.S. Drought Monitor Iowa



March 7, 2023
(Released Thursday, Mar. 9, 2023)
Valid 7 a.m. EST

| | Drought Conditions (Percent Area) | | | | | |
|---|-----------------------------------|-------|-------|-------|-------|------|
| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
| Current | 32.45 | 67.55 | 32.07 | 15.54 | 1.51 | 0.57 |
| Last Week 02-28-2023 | 25.26 | 74.74 | 32.87 | 15.54 | 1.55 | 0.57 |
| 3 Months Ago 12-06-2022 | 7.31 | 92.69 | 73.35 | 29.84 | 12.01 | 0.57 |
| Start of Calendar Year 01-03-2023 | 10.69 | 89.31 | 66.66 | 29.43 | 8.83 | 0.57 |
| Start of Water Year 09-27-2022 | 20.90 | 79.10 | 45.05 | 22.25 | 5.07 | 0.02 |
| One Year Ago 03-08-2022 | 16.35 | 83.65 | 35.06 | 0.00 | 0.00 | 0.00 |

Intensity:

| | |
|---------------------|------------------------|
| None | D2 Severe Drought |
| D0 Abnormally Dry | D3 Extreme Drought |
| D1 Moderate Drought | D4 Exceptional Drought |

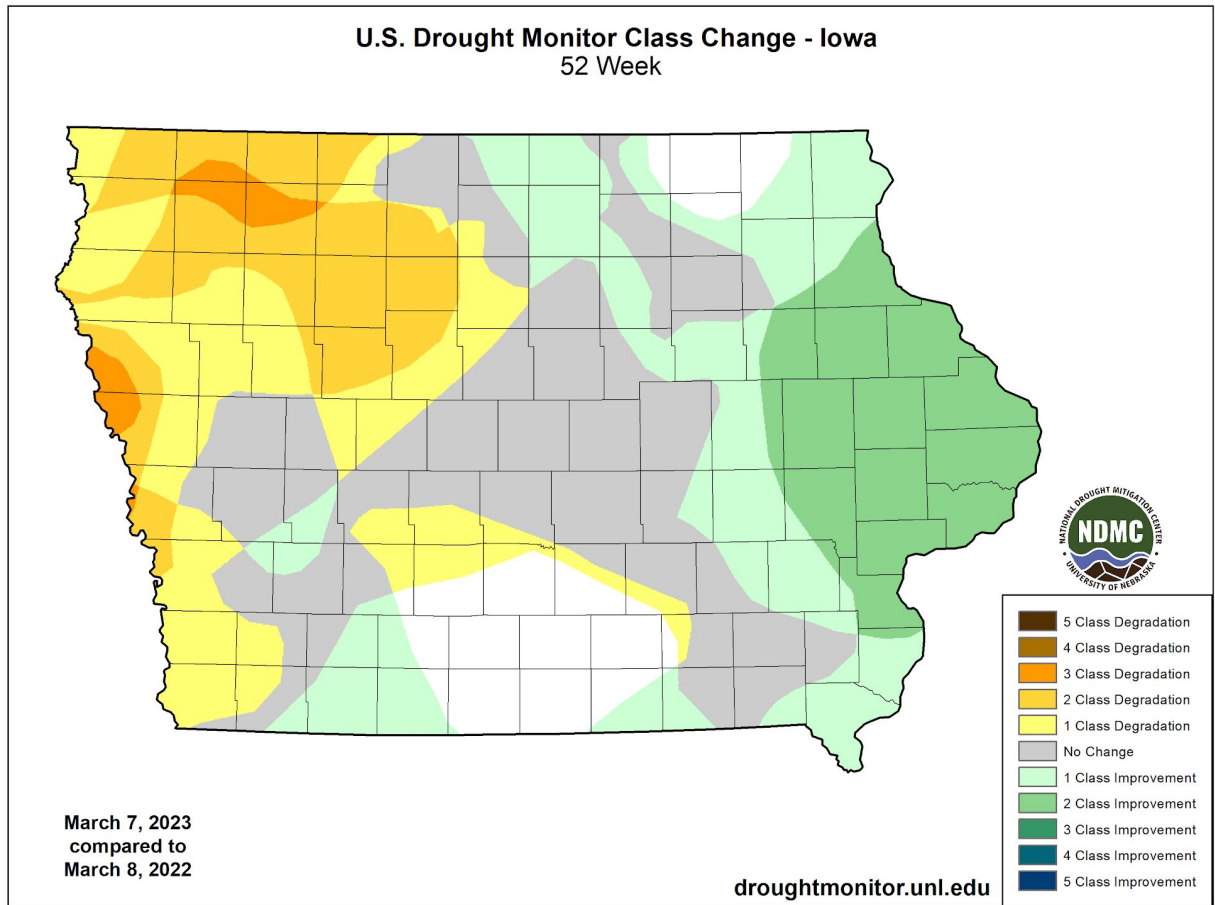
The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. For more information on the
Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:
Deborah Bathke
National Drought Mitigation Center



droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - Iowa 52 Week



Drought Monitor improvement across portions of eastern and southern Iowa over the past year; worsening to no change elsewhere



National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

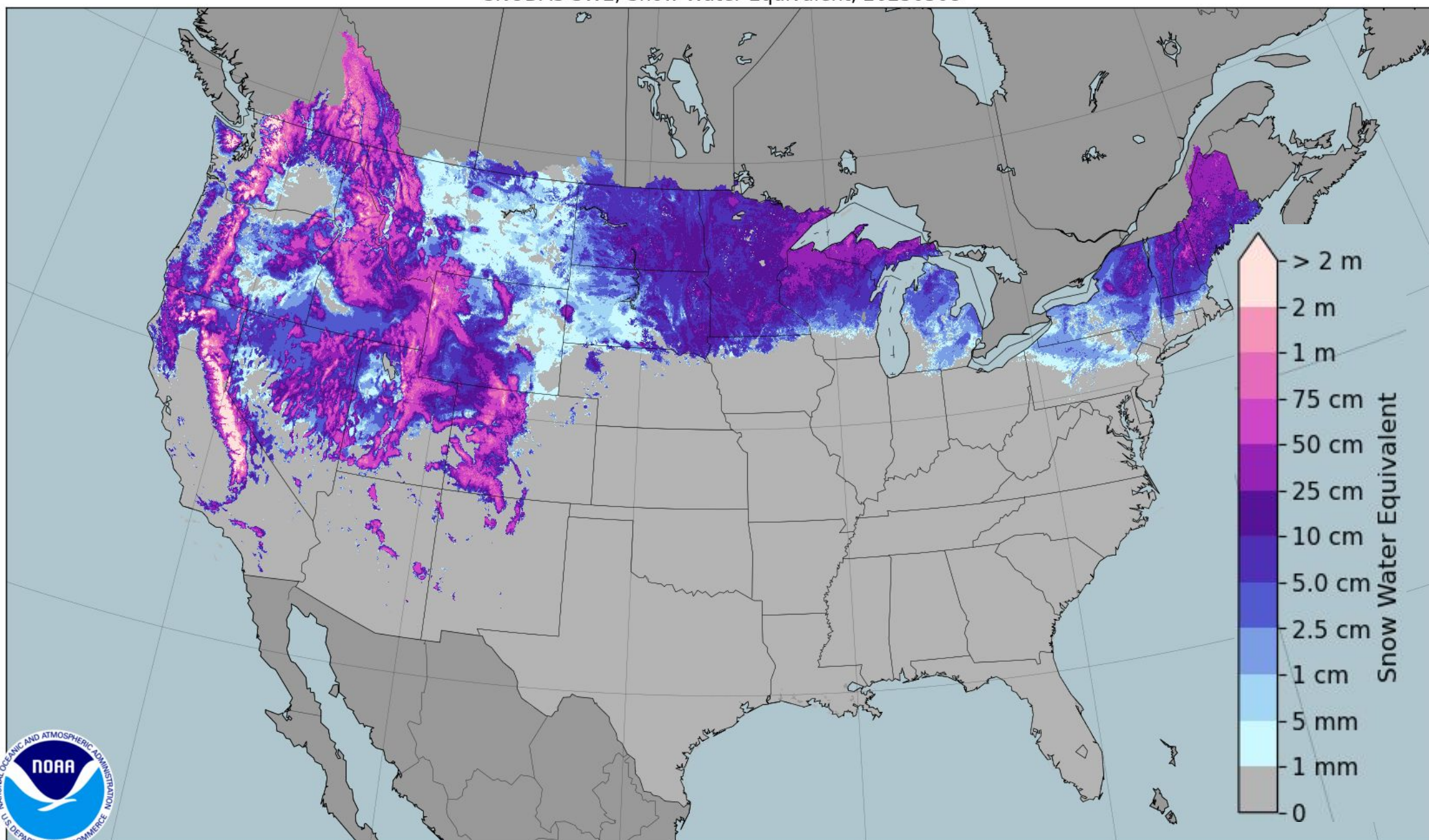
National Weather Service
Iowa



Spring 2023 Flood Outlook for Iowa

Snow water equivalent, 3/8/2023

SNODAS SWE, Snow Water Equivalent, 20230308



To convert centimeters (cm) to inches: approximately 2.5 cm equals one inch

High snow water equivalent values from South Dakota into Wisconsin including far northern Iowa



National Oceanic and Atmospheric Administration
U.S. Department of Commerce

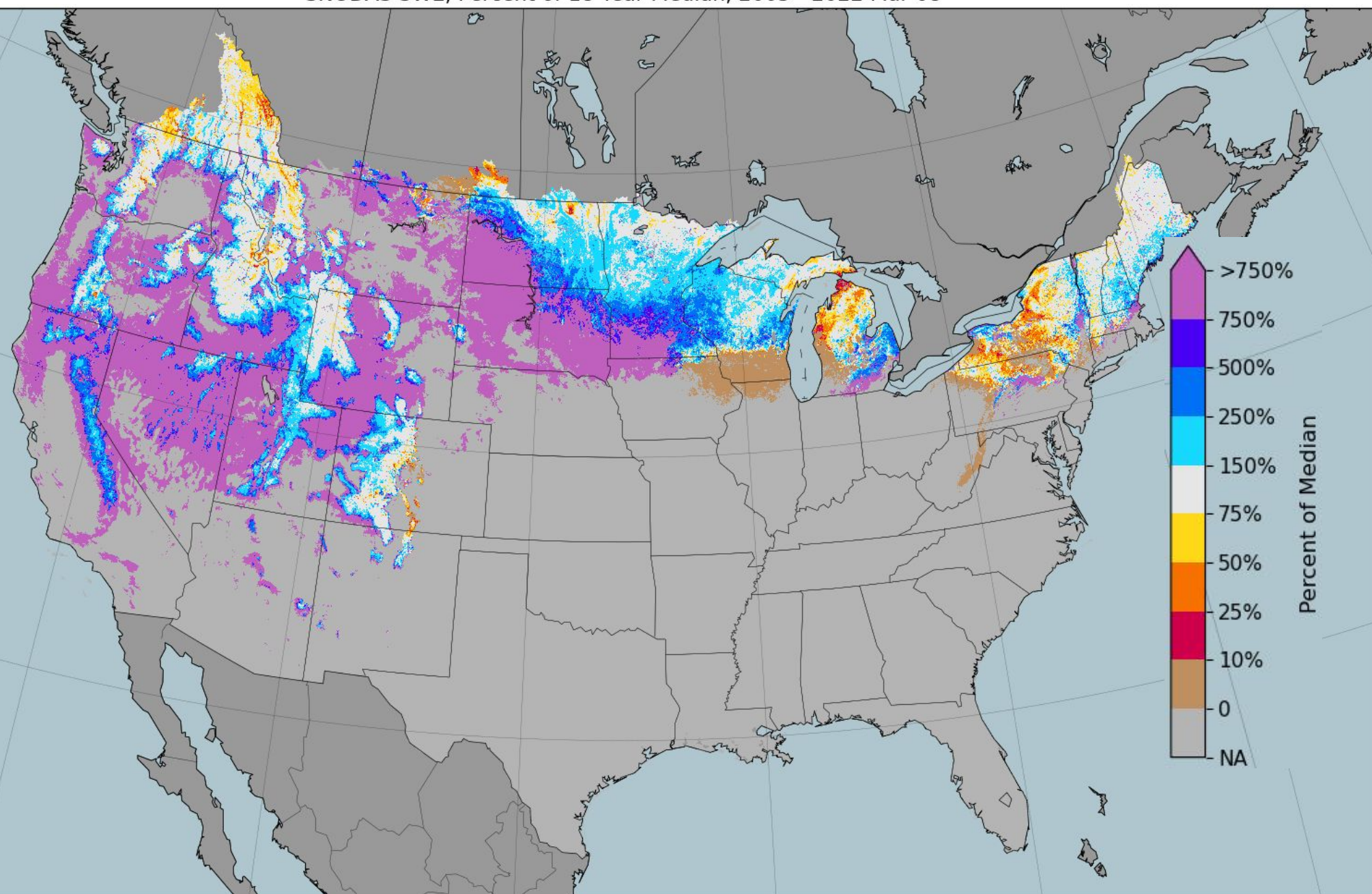
National Weather Service
Iowa



Spring 2023 Flood Outlook for Iowa

Snow water equivalent percent of normal, 3/8/2023

SNODAS SWE, Percent of 18 Year Median, 2005 - 2022 Mar 08



Very high snow water equivalent compared to normal (median) from South Dakota into Wisconsin including far northern Iowa; near to below normal elsewhere



National Oceanic and Atmospheric Administration
U.S. Department of Commerce

National Weather Service
Iowa



Spring 2023 Flood Outlook for Iowa

Frost depth, 3/8/2023



Little to no frost depth across the southern half of Iowa





Spring 2023 Flood Outlook for Iowa

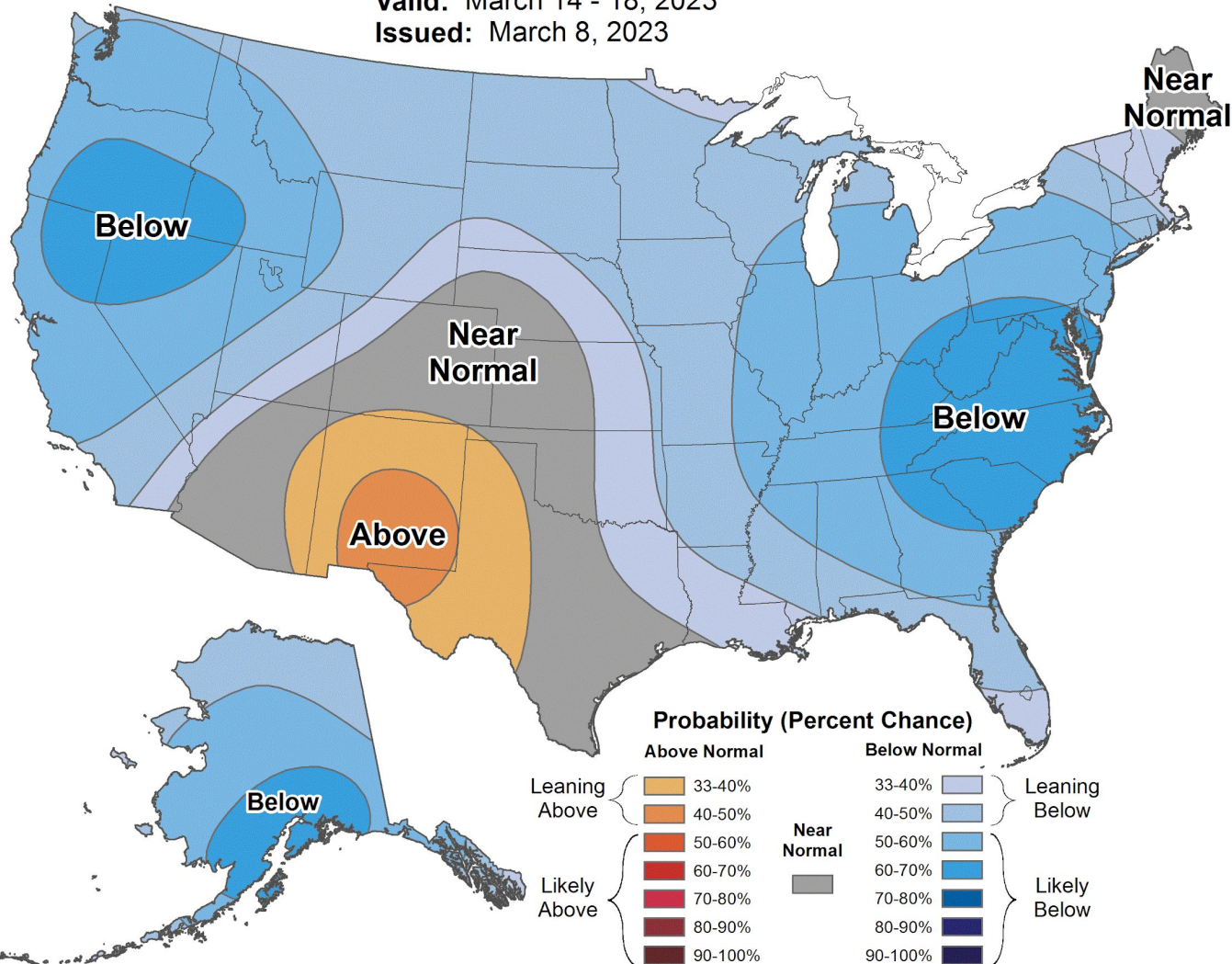
6-10 day temperature and precipitation outlooks



6-10 Day Temperature Outlook



Valid: March 14 - 18, 2023
Issued: March 8, 2023



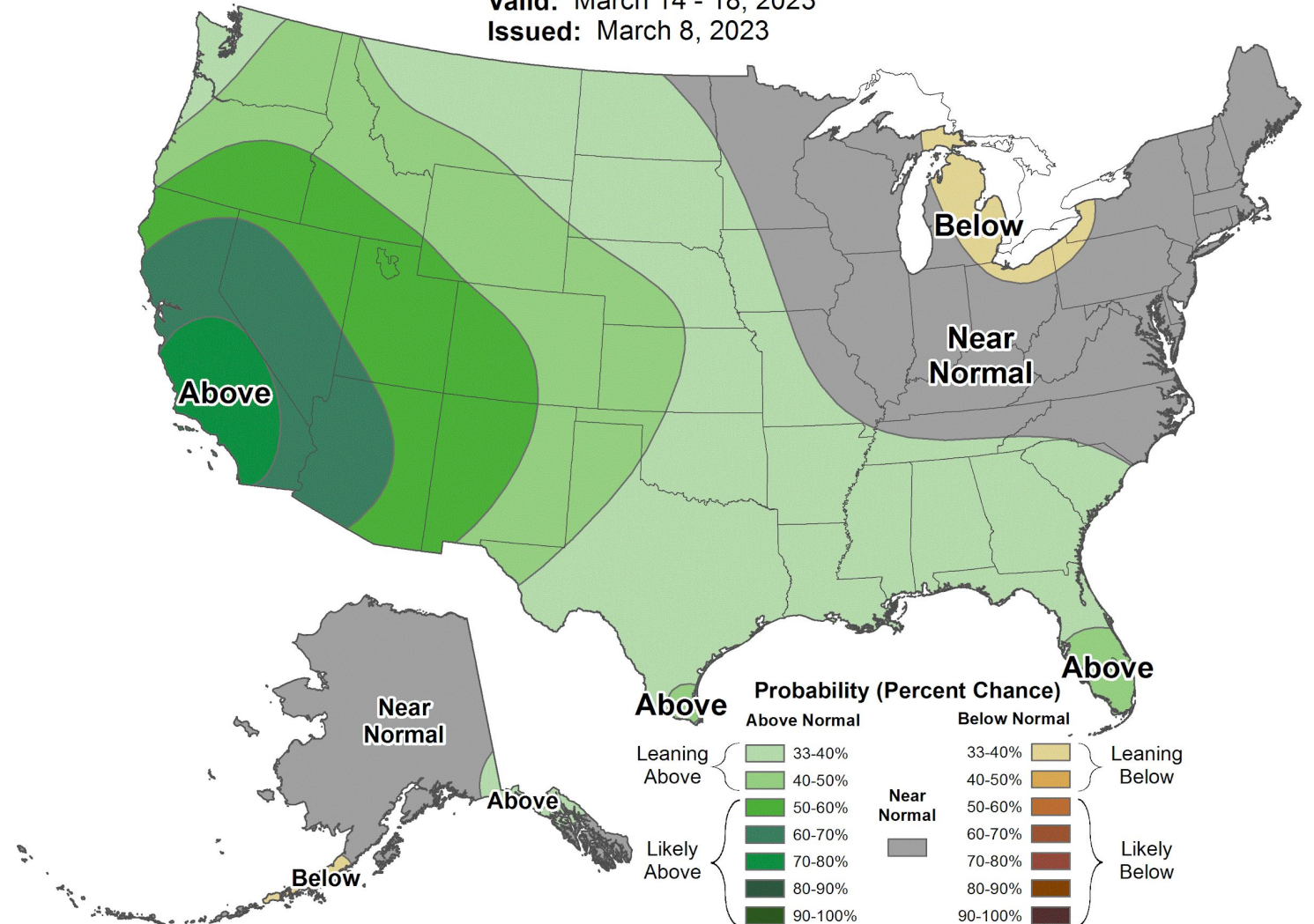
Below normal across Iowa



6-10 Day Precipitation Outlook



Valid: March 14 - 18, 2023
Issued: March 8, 2023



Above normal across western Iowa, near normal elsewhere





Spring 2023 Flood Outlook for Iowa

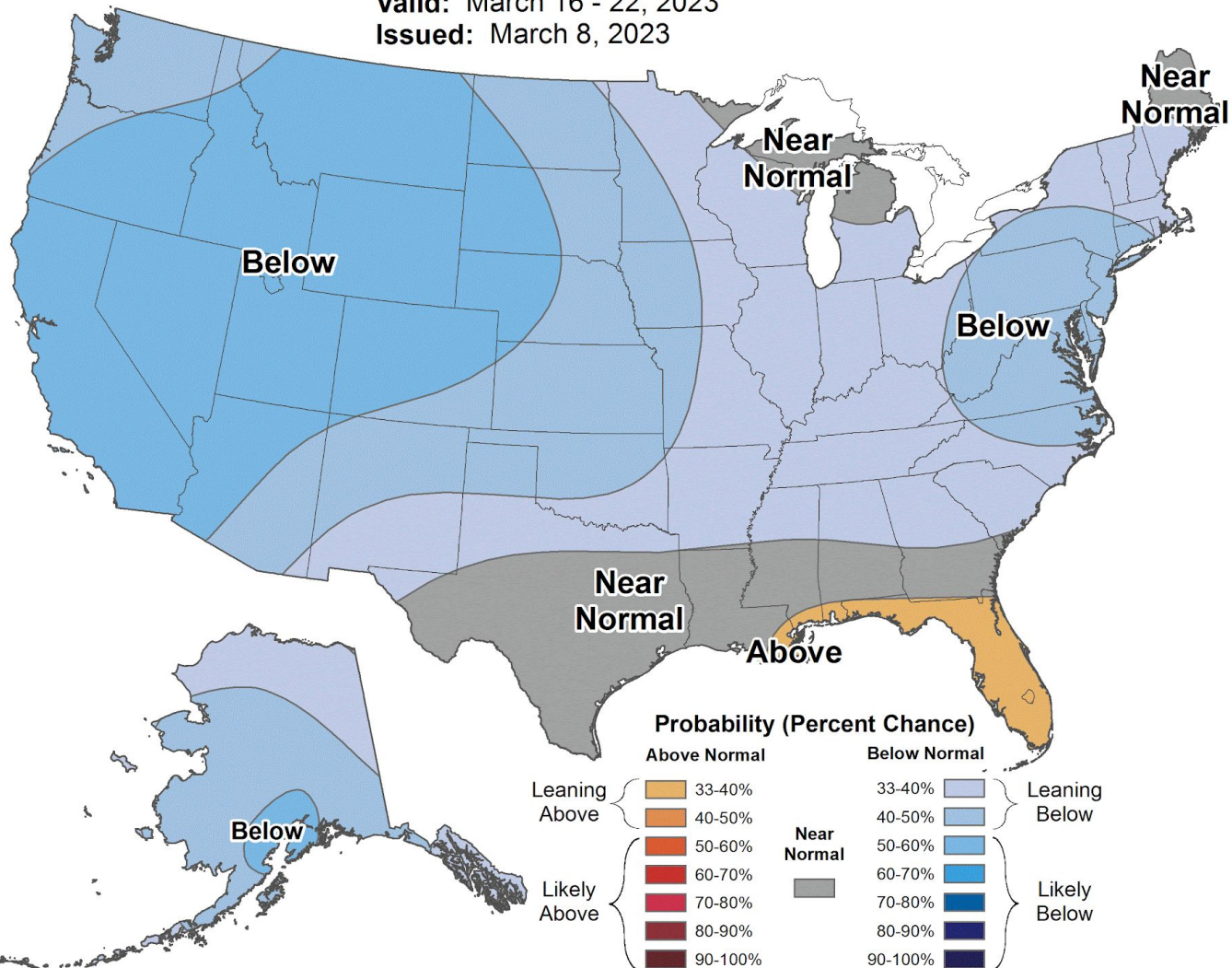
8-14 day temperature and precipitation outlooks



8-14 Day Temperature Outlook



Valid: March 16 - 22, 2023
Issued: March 8, 2023



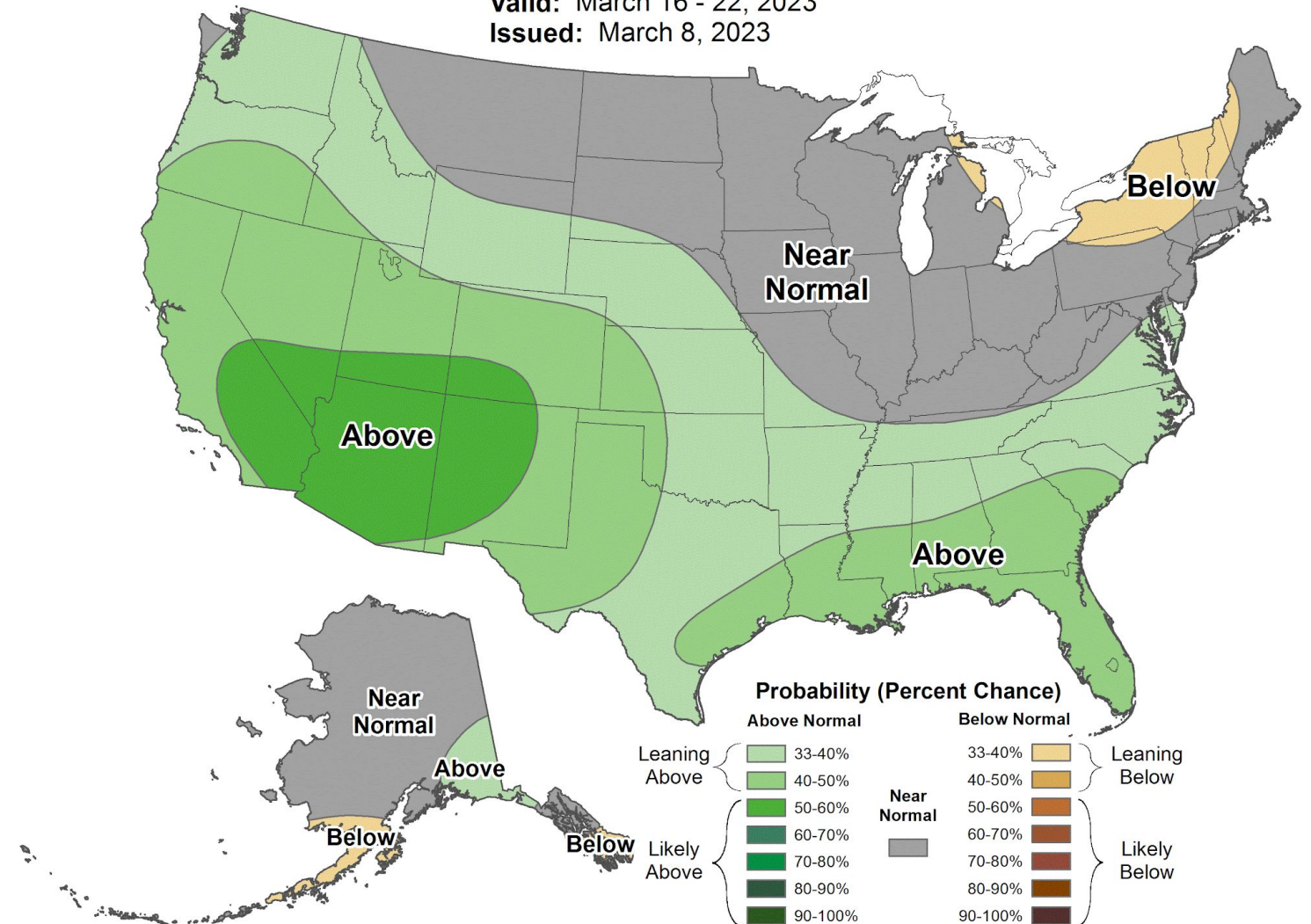
Below normal across Iowa



8-14 Day Precipitation Outlook



Valid: March 16 - 22, 2023
Issued: March 8, 2023



Near normal across Iowa





Spring 2023 Flood Outlook for Iowa

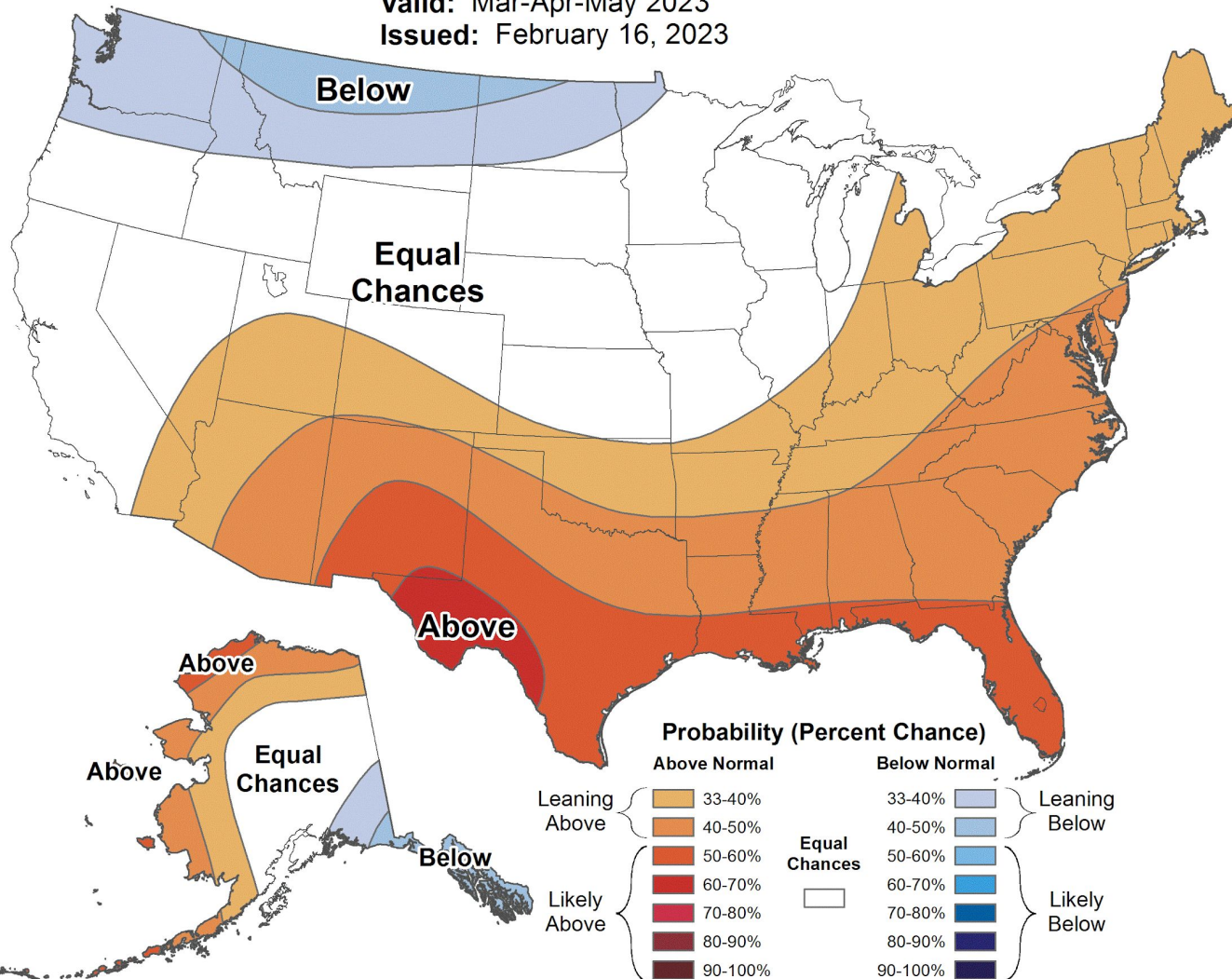
Seasonal temperature and precipitation outlooks



Seasonal Temperature Outlook



Valid: Mar-Apr-May 2023
Issued: February 16, 2023



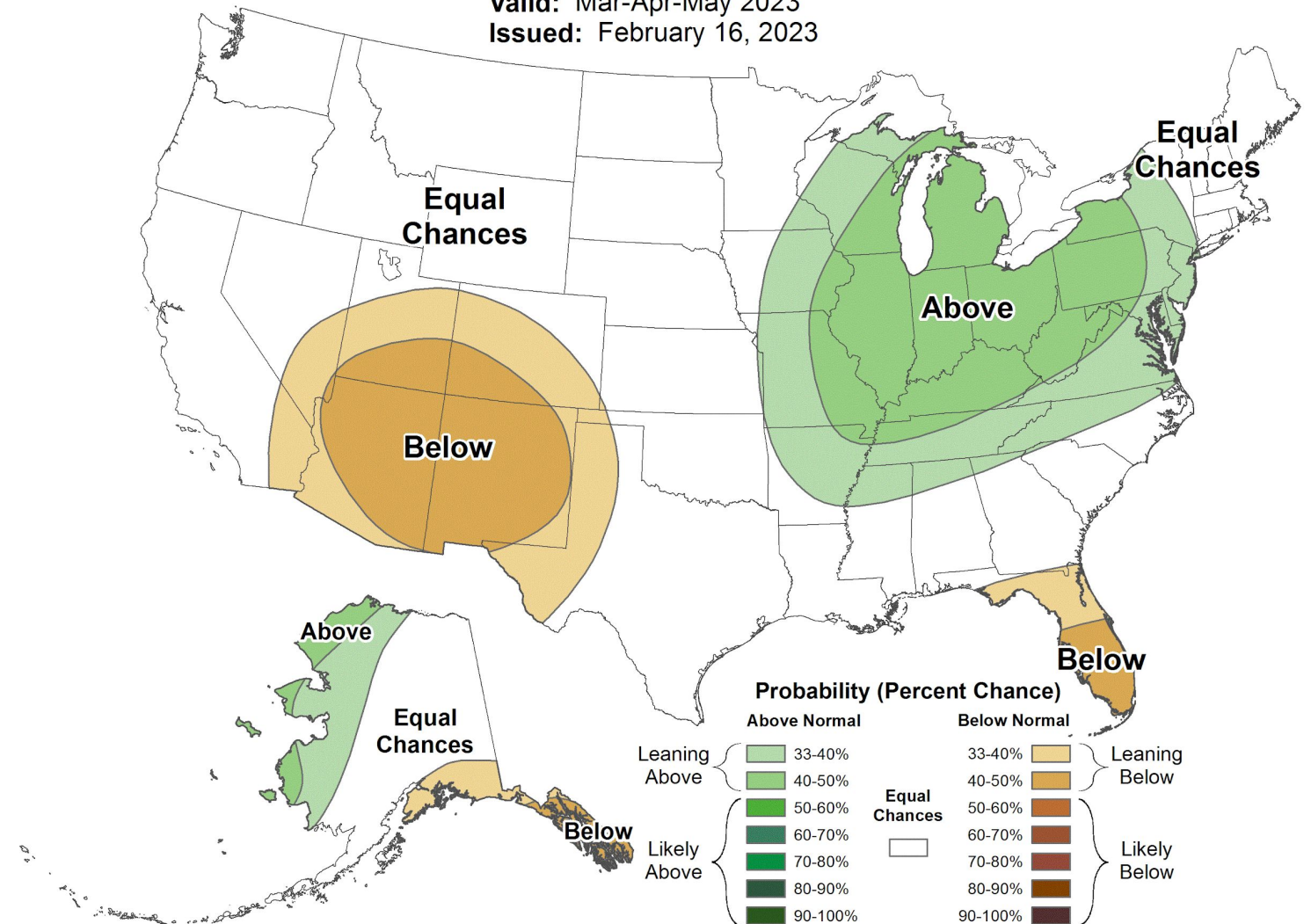
Equal chances across Iowa



Seasonal Precipitation Outlook



Valid: Mar-Apr-May 2023
Issued: February 16, 2023



Above normal across the eastern two-thirds of Iowa, equal chances elsewhere



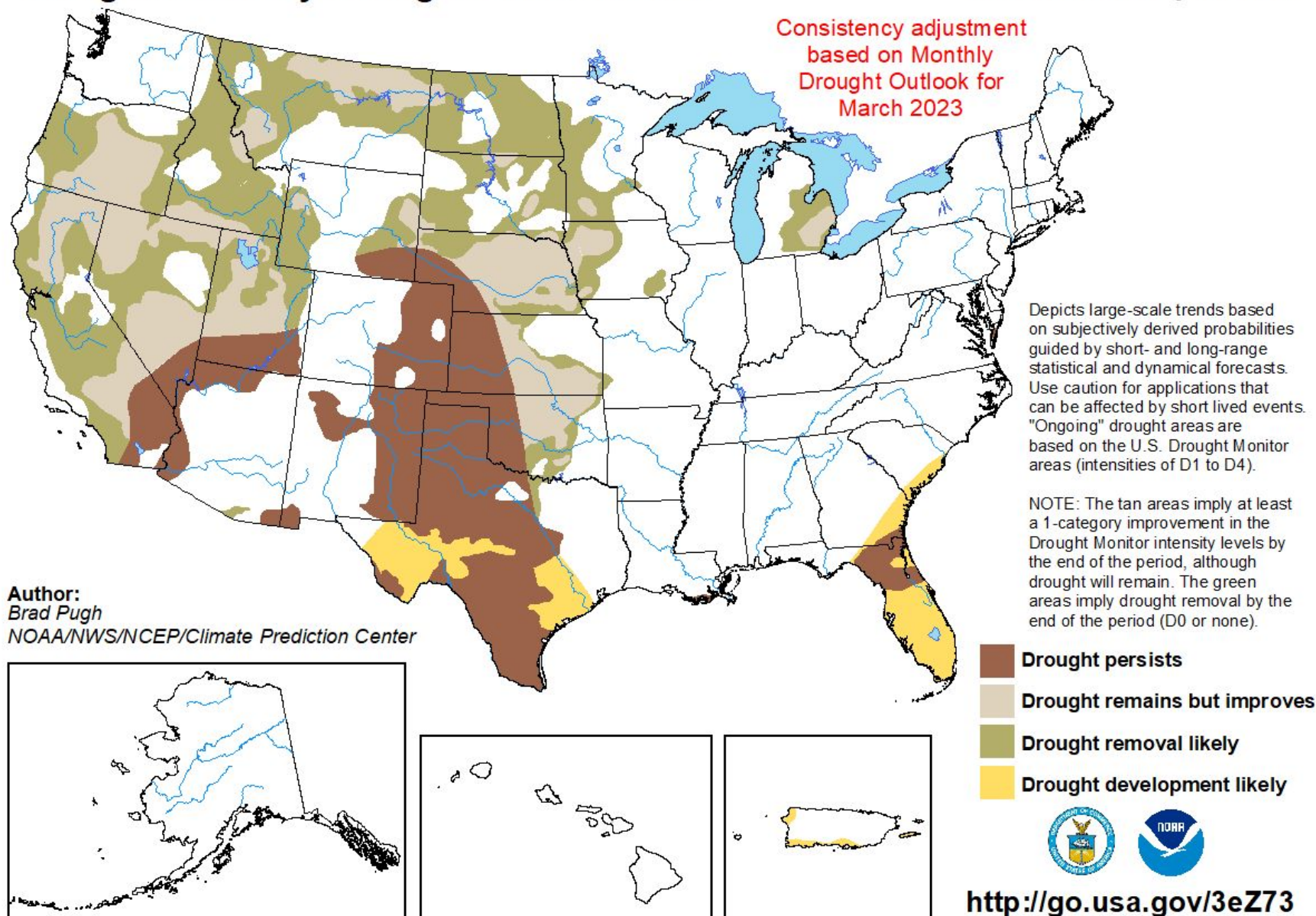


Spring 2023 Flood Outlook for Iowa

Seasonal drought outlook

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for March 1 - May 31, 2023
Released February 28, 2023



Drought conditions expected to improve across Iowa



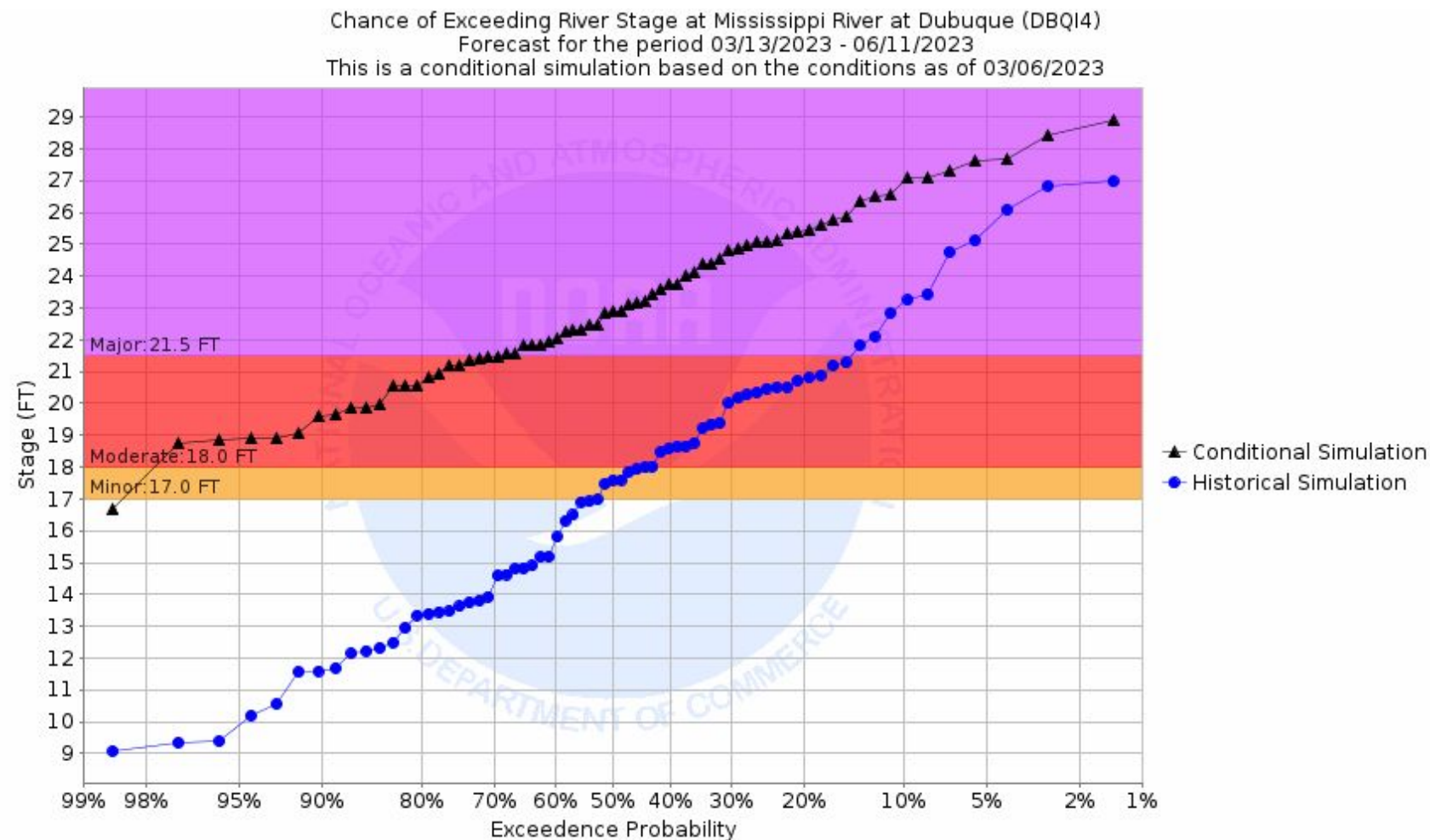


Spring 2023 Flood Outlook for Iowa

Long-range probabilistic information–90-day period

Long-Range Flood Risk (90-day period)–[Available on AHPS](#)

- Click on the Long-Range Flood Risk tab and select location of interest. Then under the Probability Information tab, select Chance of Exceeding Levels during Entire Period.
- The graph to the right represents the exceedance probabilities during the 90-day period.
- Blue line is considered the normal chance (i.e., climatology)–the historical simulation.
- Black line is based on current conditions (e.g., river levels, snowpack, etc.)–the conditional simulation.
- When the black line is left of the blue line, chances for higher river levels and flooding are higher than normal.
- Conversely, when the black line is to the right of the blue line, chances for higher river levels and flooding are lower than normal.



Example–Mississippi River at Dubuque

- Black line is left of the blue line (higher than normal chances).
- >95% chance of exceeding minor and moderate flood stage.
- 70% chance of exceeding major flood stage.



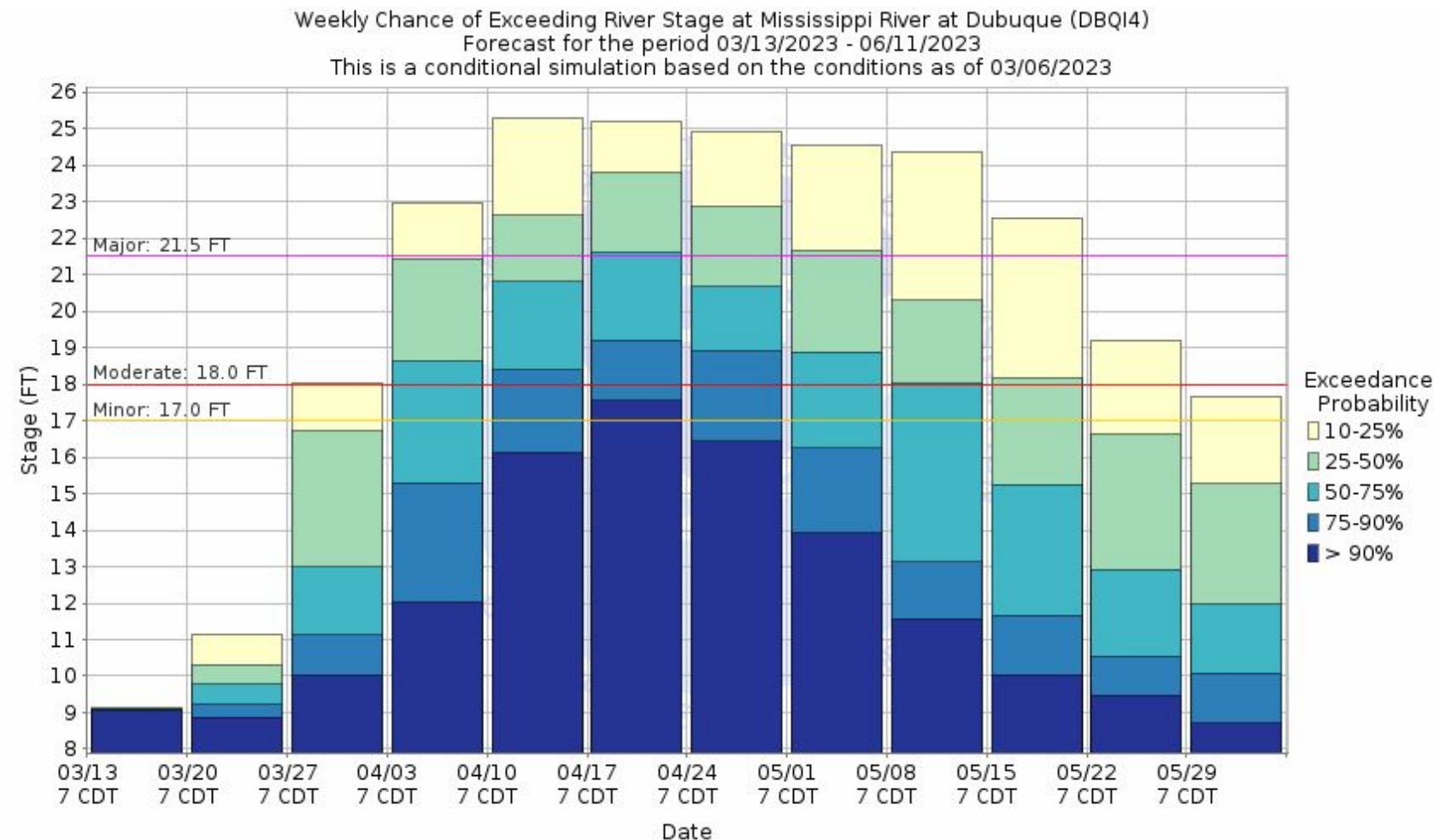


Spring 2023 Flood Outlook for Iowa

Long-range probabilistic information—weekly chances during 90-day period

Long-Range Flood Risk (weekly chances during 90-day period)—[Available on AHPS](#)

- Click on the Long-Range Flood Risk tab and select location of interest. Then under the Probability Information tab, select Weekly Chance of Exceeding Levels.
- The graph to the right represents the exceedance probabilities each week during the 90-day period.
- Yellow color of the bar graph represents the 10-25% exceedance probability. Essentially, there is a 10-25% chance that the river will reach that particular level during that particular week.
- The exceedance probabilities increase as colors become more blue—25-50% (light green), 50-75% (teal), 75-90% (light blue) and >90% (dark blue).



Example—Mississippi River at Dubuque

- Higher chances of flooding begin in early April, with the best chance of reaching minor flood stage in mid April.

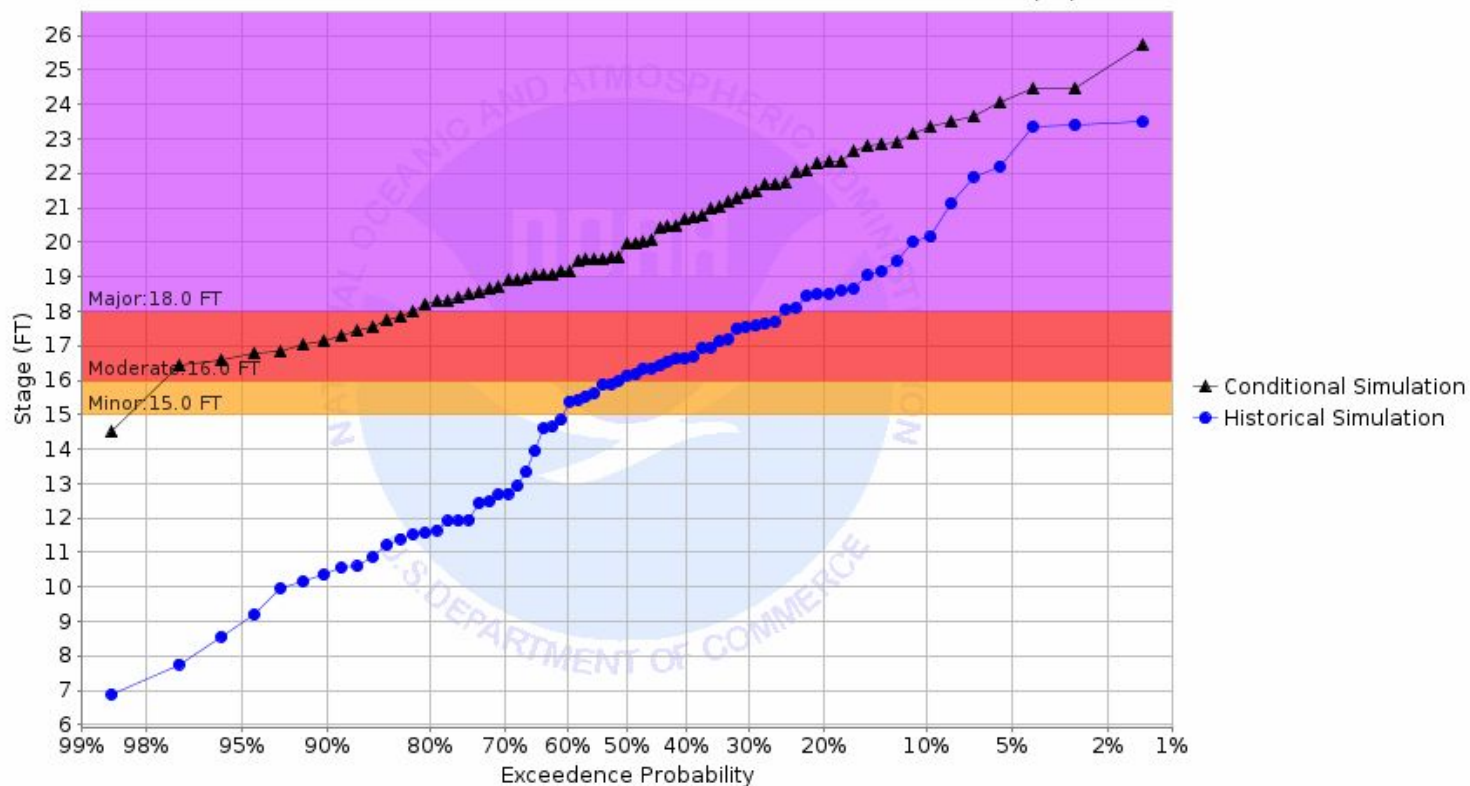




Spring 2023 Flood Outlook for Iowa

More examples—long-range probabilistic info—90-day period

Chance of Exceeding River Stage at Mississippi River at Rock Island L&D 15 (RCK12)
Forecast for the period 03/13/2023 - 06/11/2023
This is a conditional simulation based on the conditions as of 03/06/2023

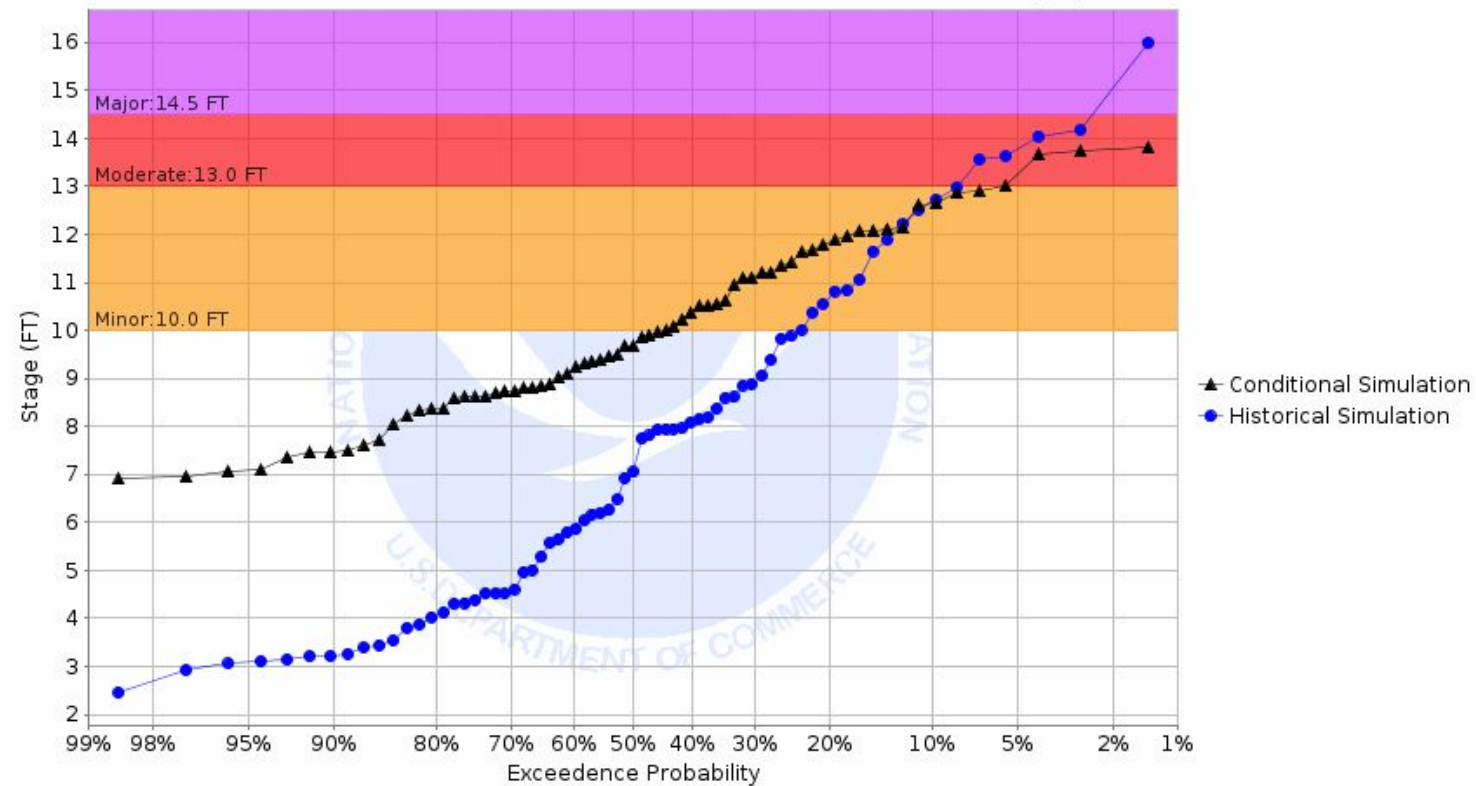


Mississippi River at Quad Cities L&D 15

- Black line is left of the blue line (higher than normal chances).
- >95% chance of exceeding minor and moderate flood stage.
- 80% chance of exceeding major flood stage.

[More graphics available on AHPS](#)

Chance of Exceeding River Stage at Des Moines River at Estherville (ESV14)
Forecast for the period 03/13/2023 - 06/11/2023
This is a conditional simulation based on the conditions as of 03/06/2023



West Fork Des Moines River at Estherville

- Black line is left of the blue line for minor flooding (higher than normal chances).
- Black line is right of the blue line for moderate and major flooding (lower than normal chances).
- 45% chance of exceeding minor flood stage.

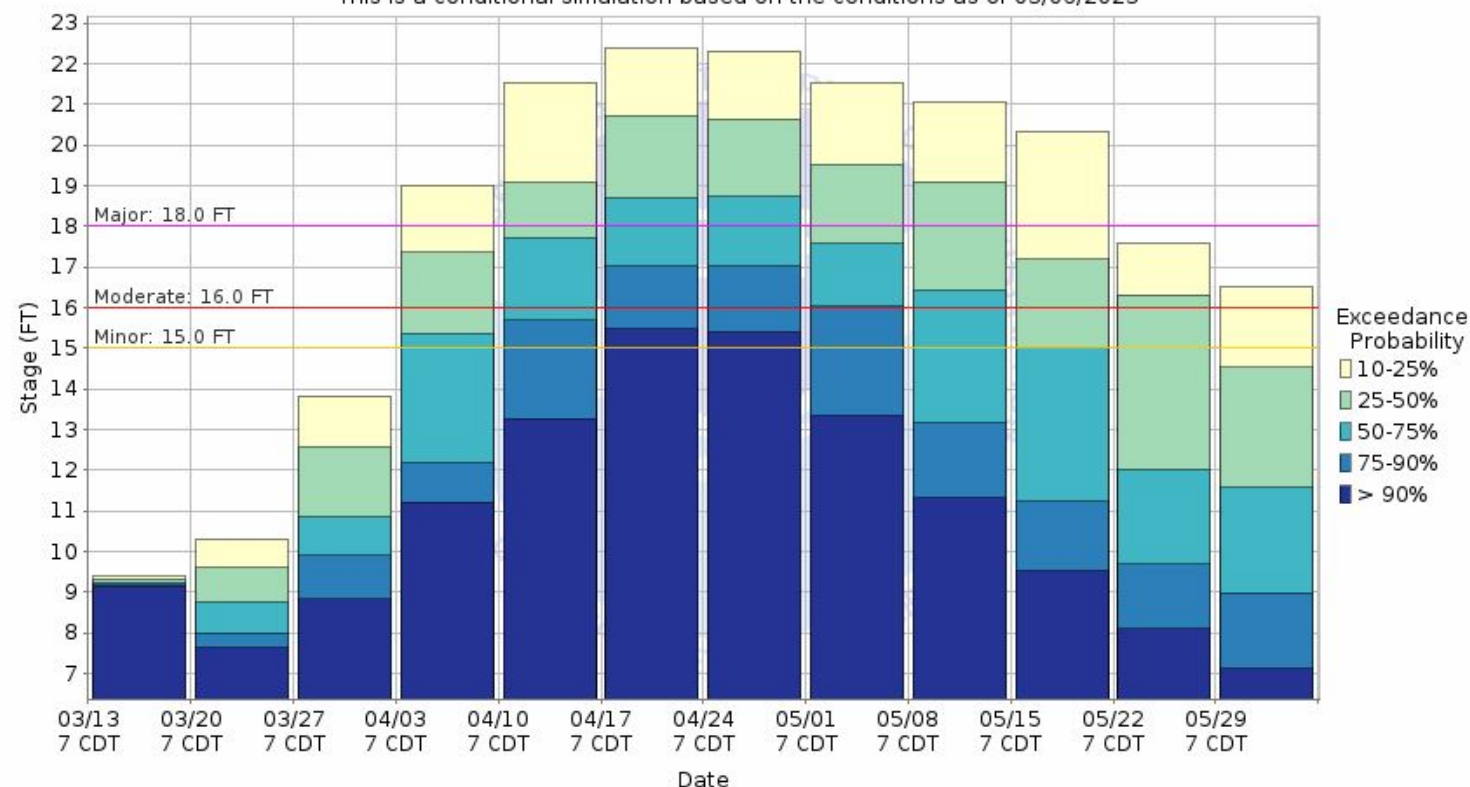




Spring 2023 Flood Outlook for Iowa

More examples—long-range probabilistic info—weekly chances during 90-day period

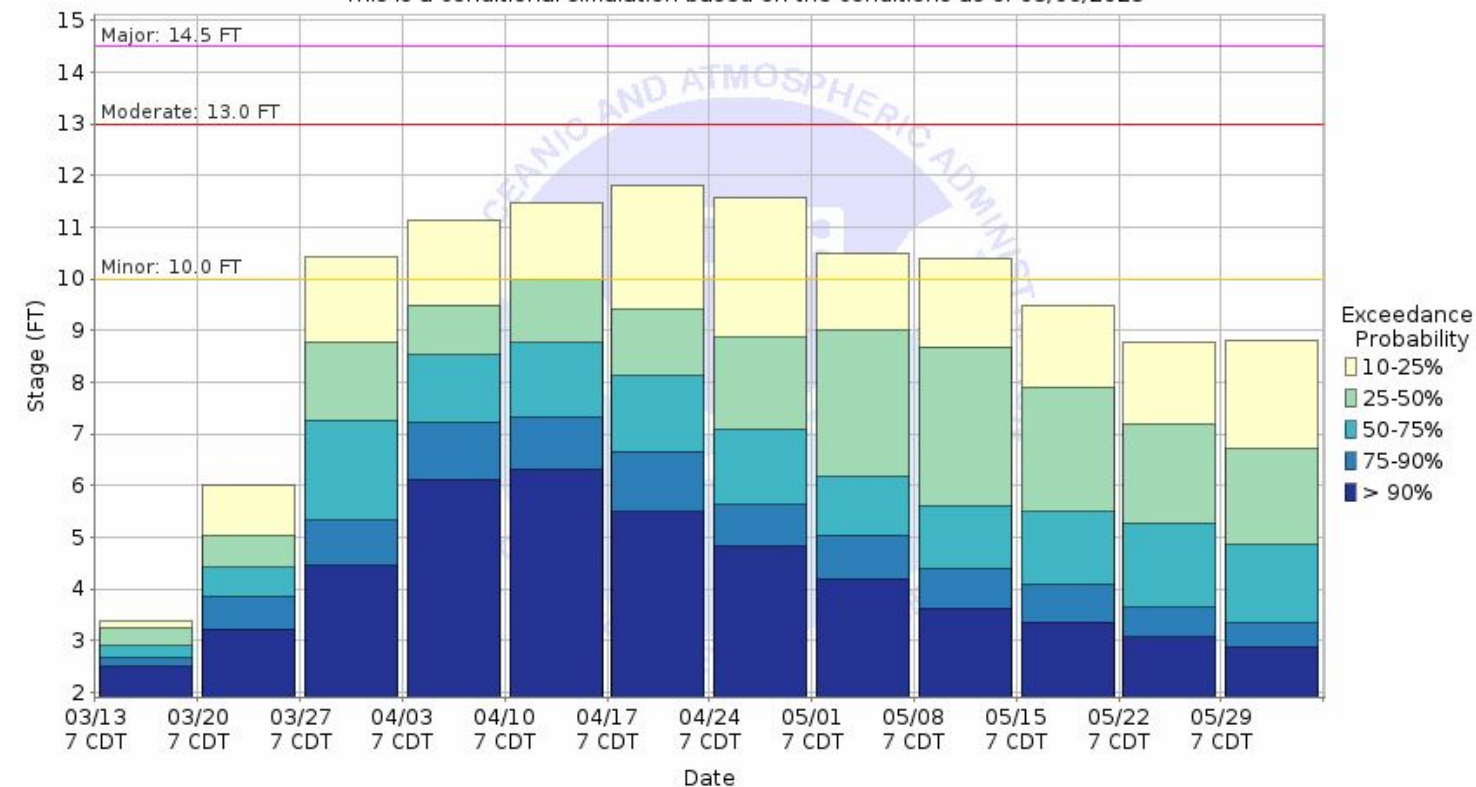
Weekly Chance of Exceeding River Stage at Mississippi River at Rock Island L&D 15 (RCKI2)
Forecast for the period 03/13/2023 - 06/11/2023
This is a conditional simulation based on the conditions as of 03/06/2023



Mississippi River at Quad Cities L&D 15

- Higher chances of flooding begin in early April, with the best chance of reaching minor flood stage in mid to late April.

Weekly Chance of Exceeding River Stage at Des Moines River at Estherville (ESVI4)
Forecast for the period 03/13/2023 - 06/11/2023
This is a conditional simulation based on the conditions as of 03/06/2023



West Fork Des Moines River at Estherville

- Higher chances of flooding begin in early April, with the best chance of reaching minor flood stage in mid April.

[More graphics available on AHPS](#)





Spring 2023 Flood Outlook for Iowa

How to access probabilistic information on our Website

www.weather.gov/desmoines

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, St" or ZIP code
Enter location ... Go
[Location Help](#)

News Headlines

- Winter Storm Watch Portions of Northern Iowa Thursday Afternoon and Night
- The March Edition of the Weather Whisper Newsletter is Now Published!
- NEW - 2023 Spotter Training Schedule Released
- NWS Des Moines Spring Flood Outlook Schedule

WINTER STORM THURSDAY INTO THURSDAY NIGHT
Click to view briefing.

MY FORECAST
2 Miles NNE Des Moines IA

NWS Forecast Office Des Moines, IA
[Weather.gov](#) > Des Moines, IA

Current Hazards Current Conditions Radar Forecast **Rivers and Lakes** Climate and Past Weather Local Programs

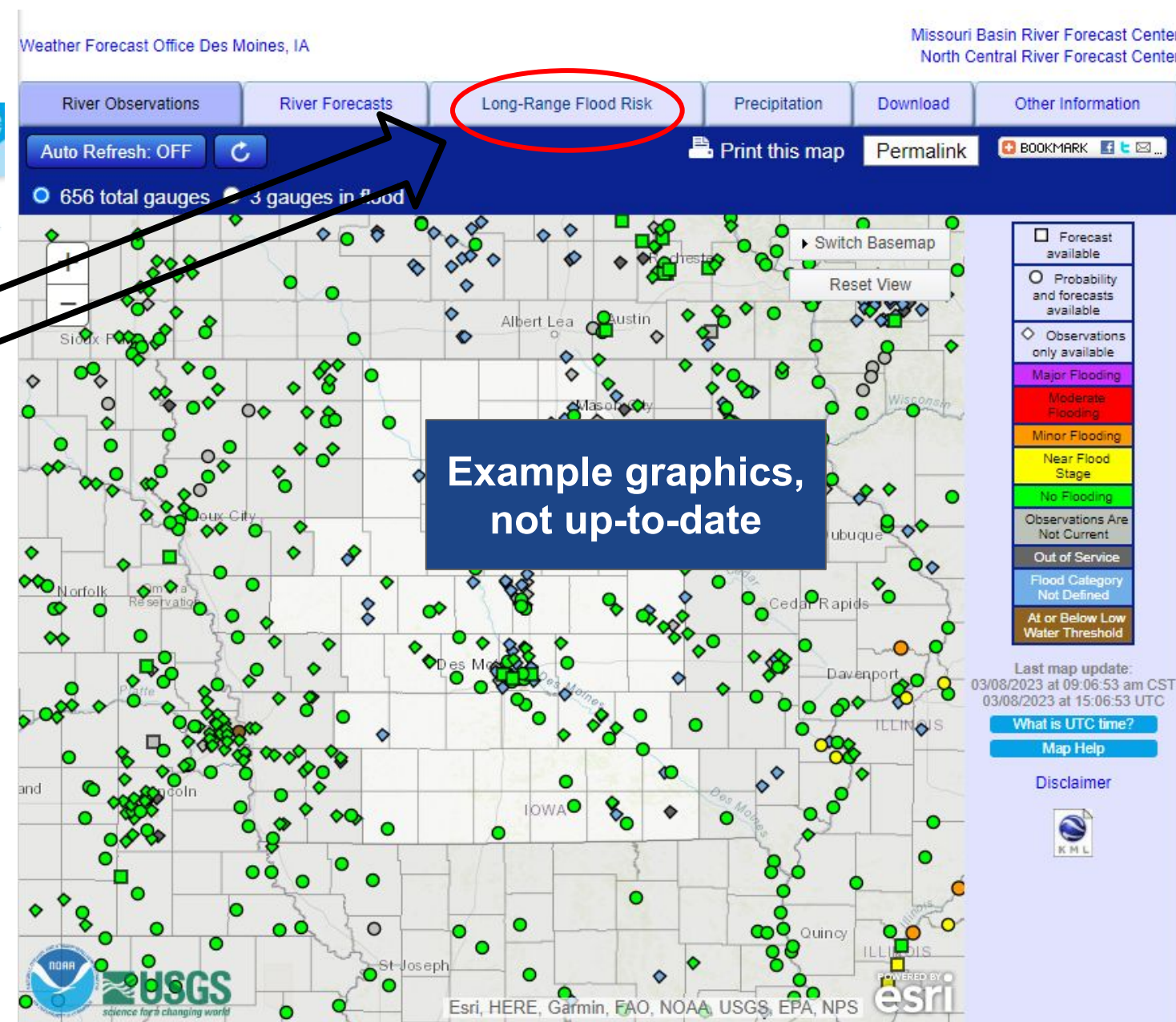
Click a location below for detailed forecast.

Watches, Warnings & Advisories

- Winter Weather Advisory
- Winter Storm Watch
- Hazardous Weather Outlook

Example graphics, not up-to-date

Last Map Update: Wed, Mar. 8, 2023 at 8:58:18 am CST



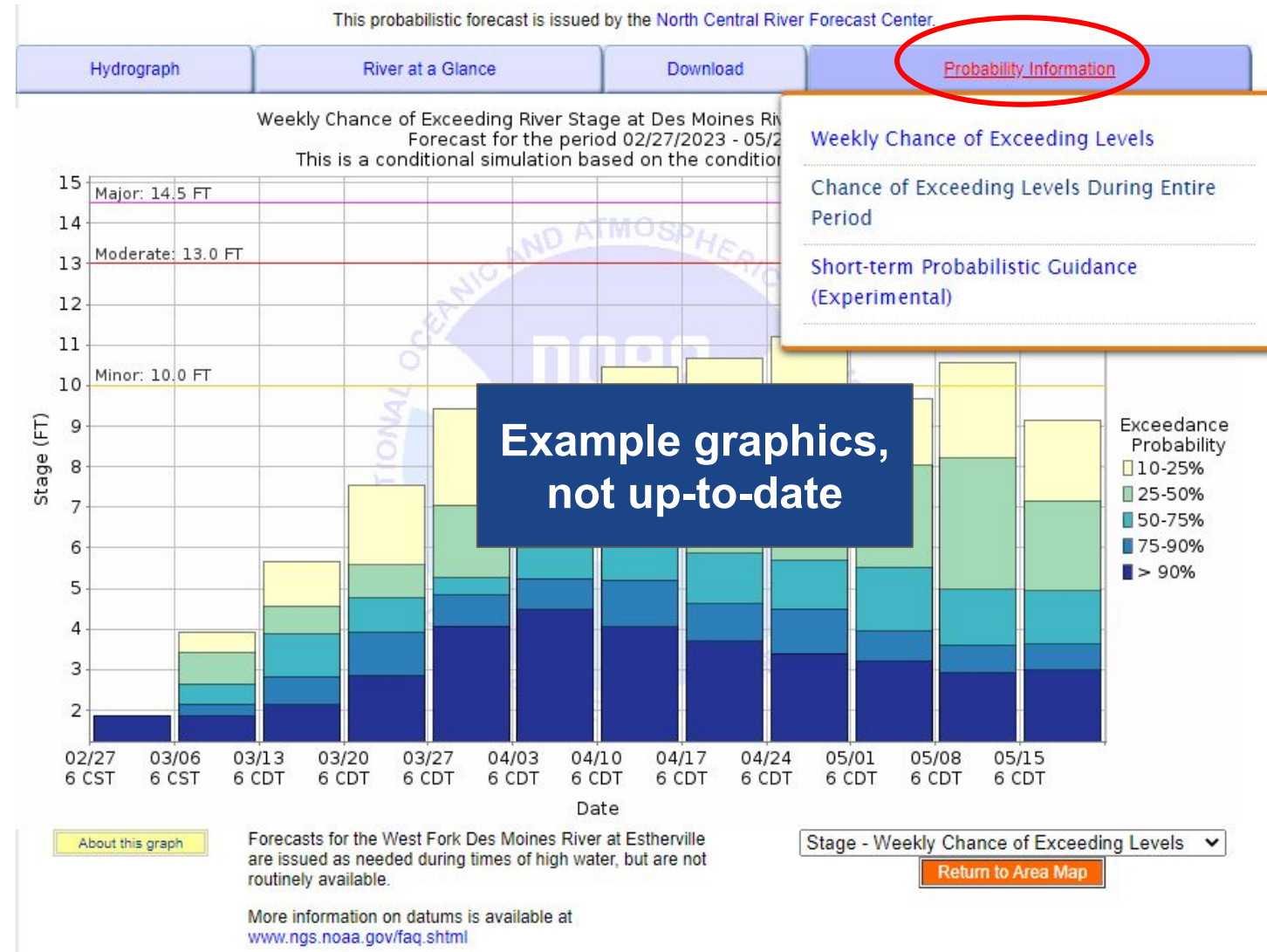
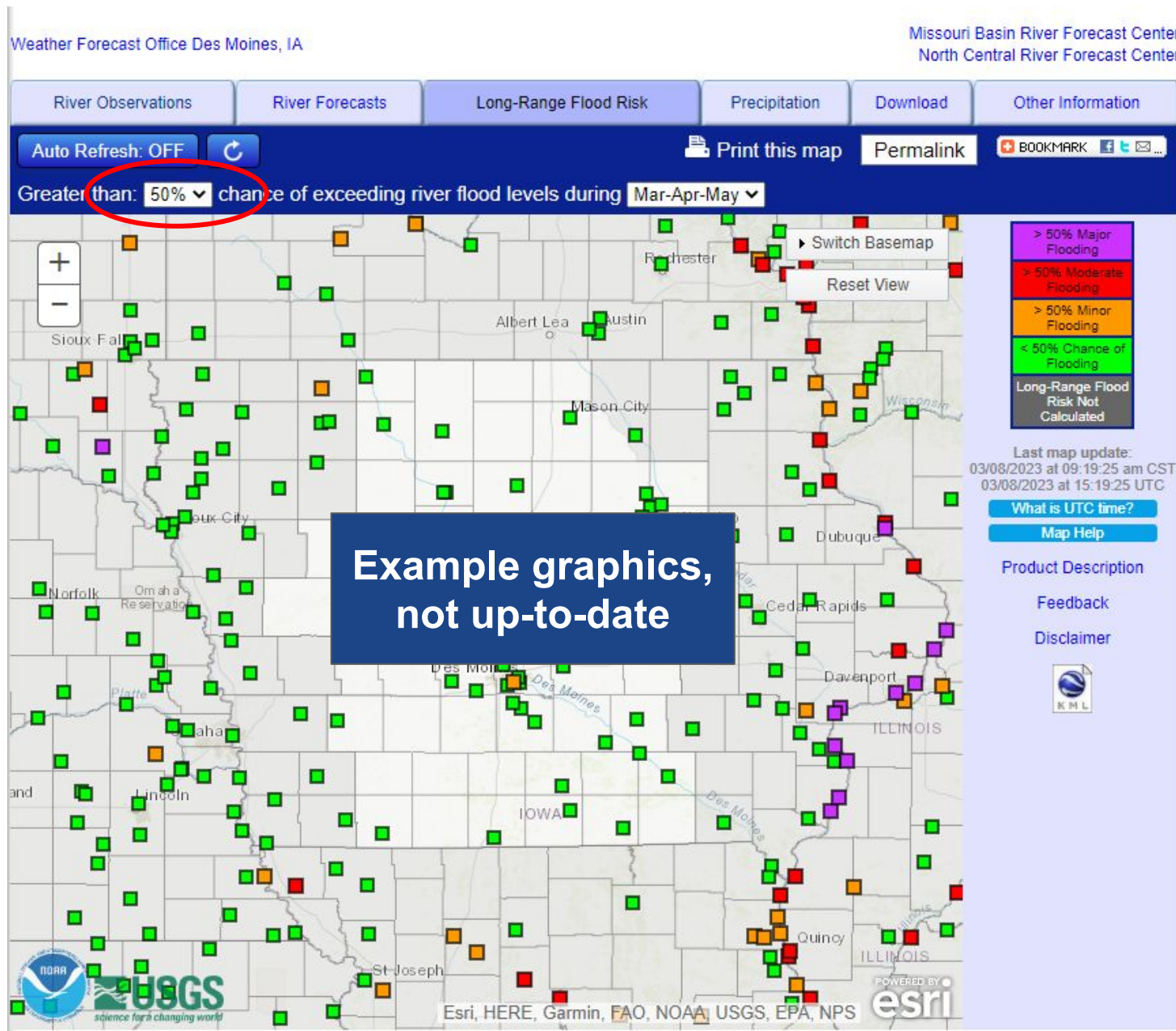
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

National Weather Service
Iowa



Spring 2023 Flood Outlook for Iowa

How to access probabilistic information on our Website





Spring 2023 Flood Outlook for Iowa

Flood risk by river, 3/8/2023

Below is the spring flood risk for the rivers in and bordering Iowa. Where the risk on a given river changes above or below a certain point, the river is broken into segments.

| River | Spring Flood Risk |
|--|--|
| Mississippi River–down to Davenport | Much above normal. Probabilities for significant flooding have increased. |
| Mississippi River–downstream of Davenport | Much above normal. Probabilities for significant flooding have increased. |
| Big Sioux River (far northwest Iowa) | Near normal |
| Missouri River–down to Council Bluffs | Near to below normal |
| Missouri River–downstream of Council Bluffs | Above normal |
| Tributaries to Mississippi River in Eastern Iowa | Near to below normal |
| Tributaries to Mississippi River in Central Iowa | Near to below normal |
| Tributaries to Big Sioux River | Near normal |
| Tributaries to Missouri River in Iowa | Near to below normal |





Spring 2023 Flood Outlook for Iowa

Spring flood element checklist, 3/8/2023

Below is the spring flood element checklist including the impact of current conditions on potential spring flooding. The individual elements appear on the following slides. Flooding from ice jams is a minimal risk this year, but there may be some localized issues mainly across the far north.

| Element | Impact on Potential Spring Flooding | Link to Latest Information |
|--------------------------------|--|--|
| River levels | Neutral to increased risk | USGS WaterWatch |
| Soil moisture | Increased risk (northeast), neutral (central), decreased risk (far west) | NWS/CPC Soil Moisture |
| Snowpack/snow water equivalent | Neutral; increased risk for the Mississippi River and upper portions of the Des Moines River basin | NWS/NOHRSC Snow Water Equivalent |
| Frost depth | Neutral | NWS Frost Depth |
| Monthly temperature outlook | Increased risk (especially Mississippi River) | NWS/CPC Outlooks |
| Monthly precipitation outlook | Neutral to increased risk | NWS/CPC Outlooks |

For your reference, here are links to the current [Drought Monitor](#) as well as the [Seasonal Drought Outlook](#).





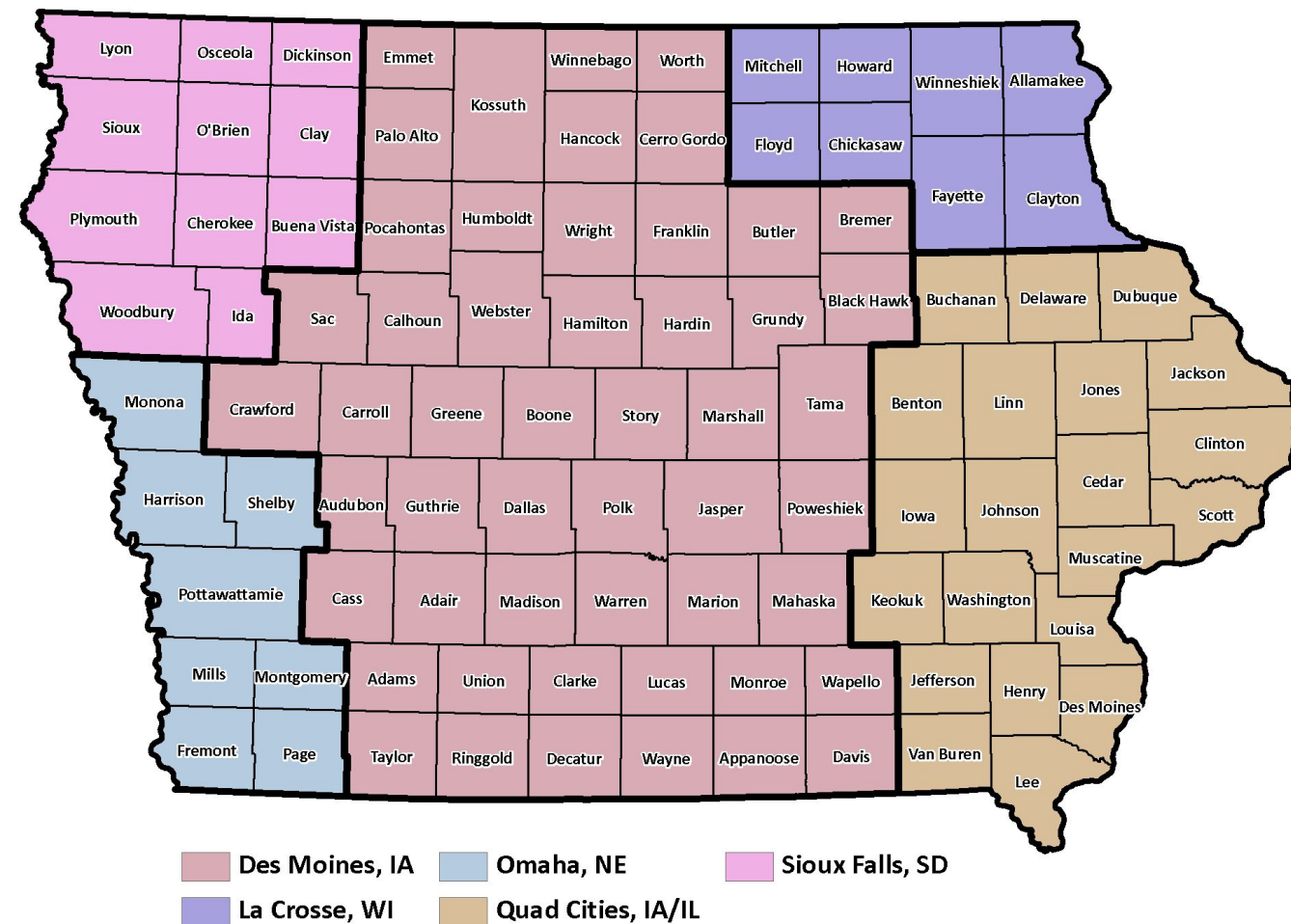
Spring 2023 Flood Outlook for Iowa

Where to find more details

Each NWS office serving Iowa provides its own spring flood outlook information for its own service area. Below are the websites for the NWS offices serving Iowa.

- NWS Des Moines: weather.gov/desmoines
- NWS Quad Cities, IA/IL: weather.gov/quadcities
- NWS Sioux Falls, SD: weather.gov/siouxfalls
- NWS Omaha, NE: weather.gov/omaha
- NWS La Crosse, WI: weather.gov/lacrosse

NWS office service areas



For the latest river stage and forecast information, along with quantitative river flood outlook information, refer to the [NWS Advanced Hydrologic Prediction Service \(AHPS\) Website](https://www.weather.gov/ia/ahps).

